

**Remarks**

By the foregoing amendment the caption of “Figure 1” has been amended to read –Figure—and the reference to the Figure in the specification has been amended accordingly. Claim 1 has been amended to recite the chamber is at a temperature of less than 1000°C. The amendment to claim 1 is supported by page 4, lines 7-9 and lines 16-19 of the specification. In addition, the term “the mixture” has been deleted and the phrase “oxygen present in an amount of “ substituted therefore in claims 10, 11, 19, 20, 27 and 28, and the term “the species” has been deleted and –noxious substance— substituted therefore in claims 12, 13, 14, 15, 21, 22, 23, 24, 29, 30, 31 an 32. New claim 33 reciting the chamber is at a chamber of up to 750°C has been added to the application. New claim 33 is supported by page 11, line 10 of the specification. It is respectfully requested this amendment be entered as it does not constitute new matter.

The drawings have been objected on the basis the identifier “Fig. 1” should be deleted. Enclosed herewith is a Proposed Drawing Correction deleting the identifier “Figure 1” and substituting –Figure—therefore. The disclosure has been objected to on the basis “Figure 1” should be changed to—Figure—on page 4, line 23 and page 9, lines 5 and 20. As noted above, the specification has been amended accordingly,

Claims 10-15, 19-24 and 27-32 have been rejected under 35 U.S.C. §112, second paragraph on the basis there is insufficient antecedent basis for the term “mixture” and insufficient basis for the term “species.” As discussed above, these terms have been deleted from the claims.

Claims 1, 12 and 16 have been rejected under 35 U.S.C. §102(b) as anticipated by EP 802370. Before discussing the differences and deficiencies of this reference a brief review of amended claim 1 is in order. Amended claim 1 recites a process for the combustive destruction of noxious substances in a gas stream which comprises injecting the gas stream in a heated chamber with sufficient oxygen to allow substantially complete combustion therein wherein the chamber is at a temperature of less than 1000°C and wherein hydrogen is also present in the chamber as a fuel gas.

Anticipation requires the presence in a single reference of each claim limitation. Lewmar Marine v. Barient, Inc., USPQ 2d 1766, 1767 (Fed. Cir. 1987). There is no disclosure or suggestion in EP 802370 of a chamber at a temperature of less than 1000°C as in the present invention, much less the destruction of perfluoro compounds at such temperatures in the presence of hydrogen with negligible production of NO<sub>x</sub> as discussed at page 4, lines 16-19 of the specification. Accordingly, EP 802370 fails to anticipate the claimed invention.

Moreover, EP 802370 fails to render the claimed invention obvious. A analysis of obviousness include the results achieved from that combination. The Gillette Co. v. S.C. Johnson & Sons, Inc., 16 USPQ 1923, 1928 (Fed. Cir. 1990). As shown in Table II, when hydrogen is used, a flow rate of 5 sl/min of oxygen results in 100% destruction of NF<sub>3</sub>. In contrast as shown in the Table at page 3 of EP 802702, double the amount of oxygen flow rate, 10 slpm was required for 100% destruction of NF<sub>3</sub>. Accordingly, the claimed invention exhibits a desirable and unexpected and enhanced result, namely, complete combustion of a noxious substance at half the flow rate of

oxygen gas.

Claims 10, 11, 13, 14 and 15 have been rejected under 35 U.S.C. §103(a) as being unpatentable over EP 802370 further in view of U.S. Patent No. 5,510, 093 to Bartz et al. Bartz et al disclose combustive destruction of halogenated compounds at a temperature of at least 1,900°F (1037.8°C).

As discussed at page 4, lines 7-12, a substantially increased temperature (about 1000°C) has heretofore been proven necessary to provide acceptable destruction rates, however the drawbacks of this approach include the production of large quantities of nitrogen oxides (NO<sub>x</sub>) as well as reduced component lifetime. In contrast, the claimed invention provides a process in which the temperature is less than 1000°C with negligible production of NO<sub>x</sub> (page 4, lines 16-19 of the specification).

Not only does the combination of EP 802370 and Bartz et al. fail to disclose a process in which the temperature is less than 1000°C, Bartz et al. actually teaches away from such a process. Indeed, this combination is improper, as set forth in MPEP §2145(X)(D)(3.) which is reproduced below:

The totality of the prior art must be considered, and proceeding contrary to accepted wisdom in the art is evidence of nonobviousness. *In re Hedges*, 783 F.2d 1038, 228 USPQ 685 (Fed. Cir. 1986) (Applicant's claimed process for sulfonating diphenyl sulfone at a temperature above 127°C was contrary to accepted wisdom because the prior art as a whole suggested using lower temperatures for optimum results as evidenced by charring, decomposition, or reduced yields at higher temperatures.).

Furthermore, "[k]nown disadvantages in old devices which would naturally discourage search for new inventions may be taken into account in determining obviousness." *United States v. Adams*, 383 U.S. 39, 52, 148 USPQ 479, 484 (1966).

Claims 17, 18, 25 and 26 have been rejected under 35 U.S.C. §103(a) as

being unpatentable over EP 802370 in view of U.S. Patent No. 4,656,660 to Bjorkman et al. Bjorkman et al. merely teaches combustion of a waste gas laden with hydrocarbons with oxygen. As a first matter there is no reason why one skilled in the art would be motivated to combine Bjorkman et al. with EP 802370. EP 802370 is directed to removal of noxious gas streams by injecting the exhaust gas stream, oxygen and a fuel gas to a combustion zone. In contrast, Bjorkman et al. states “[p]ractical tests have shown that when wishing to combust gasified synthetic resins in waste gas of the kind in question it is sufficient merely to supply oxygen gas to the burner.” (col. 4, lines 28-31).

There is no reason why one skilled in the art would be motivated to combine Bjorkman et al. which teaches only oxygen is necessary for combustion, with EP 802370 which teaches the use of a fuel gas. The law is well established that it is improper to combine references which teach away from their combustion. MPEP §2141.02 (*See* PRIOR ART MUST BE CONSIDERED IN ITS ENTIRETY, INCLUDING DISCLOSURES THAT TEACH AWAY FROM CLAIMS, p. 2100-122). Moreover, neither Bjorkman et al., alone or in combination with EP 802 370 renders the claimed invention obvious. Even if one skilled in the art were to combine Bjorkman et al and EP 802370, at best the combination would result in heating the chamber of EP 802370 with electric means. Like EP 802370, there is no teaching or suggestion in Bjorkman et al., of the destruction of perfluoro compounds at a temperature of less than 1000°C in the presence of hydrogen with negligible production of NO<sub>x</sub>, a highly desirable and enhanced result achieved by the claimed invention.

Claims 19, 20, 21, 22, 23, 27, 28, 29, 30, 31 and 32 have been rejected


under 35 U.S.C. §103 as being unpatentable over EP 802370 in view of Bjorkman et al. and further in view of U.S. Patent No. 5,510,093 to Bartz et al. As discussed above, it would be improper to combine EP 802370 which teaches the use of a fuel gas with Bjorkman et al which teaches only oxygen is necessary for combustion. Moreover as also discussed above it would be improper to combine EP 802370 with Bartz et al. which discloses combustive destruction of halogenated compounds at a temperature of at least 1,900°F (1037.8°C) to arrive at the claimed process which specifies a temperature of less than 1000°C.

Further, none of these references alone or in combination disclose or suggest a process for the combustive destructive of noxious substances at a temperature of less than 1000°C in the presence of hydrogen which exhibits the highly desirable and enhanced result of negligible production of NO<sub>x</sub> as in the claimed invention.

In view of the foregoing claims 1, 10-33, all the pending claims, are in proper form and in condition for allowance.

Prompt and favorable action is respectfully requested.

Respectfully submitted,



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